DRAFT

Medicare Coverage Advisory Committee – Evaluative Questions

1. How well does the current scientific evidence support well-defined indications for the use of these technologies in the treatment of nonunion fractures?

** 1 – Poorly * 2 * 3 – Reasonably Well * 4 * 5 – Very Well*

Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices
Score	Score	Score	Score

2. How confident are you in the validity of the scientific evidence for biophysical enhancement in nonunion treatments on the following outcomes:

1 – No Confidence -- 2 -- 3 – Moderate Confidence -- 4 -- 5 – High Confidence

	Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices
Morbidity (infection, amputation, permanent loss of limb function)	Score	Score	Score	Score
Radiographic Healing	Score	Score	Score	Score
Clinical healing	Score	Score	Score	Score
Radiographic and Clinical Healing	Score	Score	Score	Score

3. How likely is it that the following treatments for nonunion fractures will positively affect the following health outcomes, where the outcome is causally related to the respective biophysical enhancement?

1 – Not Likely -- 2 -- 3 – Reasonably Likely -- 4 -- 5 – Very Likely

	Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices
Morbidity (infection, amputation, permanent loss of limb function)	Score	Score	Score	Score
Radiographic Healing	Score	Score	Score	Score
Clinical Healing	Score	Score	Score	Score
Radiographic and Clinical Healing	Score	Score	Score	Score

4. How confident are you that the following technologies will produce a clinically important net health benefit for patients with a nonunion fracture?

1 – No Confidence -- 2 -- 3 – Moderate Confidence -- 4 -- 5 – High Confidence

Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices

Score	**Score**	Score	Score

5. How confident are you that the improved net health outcomes will hold for the nonunion treatments when surgery is not first performed?

1 – No Confidence -- 2 -- 3 – Moderate Confidence -- 4 -- 5 – High Confidence

Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices
Score	Score	Score	

6. How confident are you that the improved net health outcomes will hold for off-label treatments of nonunion fractures using orthobiologic devices?

1 – No Confidence -- 2 -- 3 – Moderate Confidence -- 4 -- 5 – High Confidence

Score

7. How likely is it that completely healed nonunion fractures resulting from these treatments can be generalized to:

1 – Not Likely -- 2 -- 3 – Reasonably Likely -- 4 -- 5 – Very Likely

	Ultrasound	Internal Electrical Stimulation	External Electrical Stimulation	Orthobiologic Devices
a. Fracture types for which there are no clinical studies:	**Score**	**Score**	**Score**	**Score**
b. Providers (facilities/physicians) practice:	**Score**	**Score**	**Score**	**Score**
c. Medicare population	**Score**	**Score**	**Score**	**Score**

8. How confident are you that orthobiologics such as Bone Morphogenic Protein 2 and Bone Morphogenic Protein 7 are equivalent in the treatment of nonunion fractures?

1 – No Confidence -- 2 -- 3 – Moderate Confidence -- 4 -- 5 – High Confidence

Score

Definitions

Fracture type – Bones (excluding vertebrae and skull) fractured due to various types of trauma, including high-energy trauma, higher grade and open fractures, comminution of the fracture, vertical or oblique fracture pattern, and fracture displacement.

Nonunion fracture – Cessation of the fracture repair process without adequate healing.

Radiographic healing – Includes callus size, cortical continuity, and progressive loss of fracture line.

Clinical healing – Includes absence of pain at site of nonunion, no pain on weight-bearing, and return of normal limb function.

Ultrasound Stimulators- A non-invasive device that emits low intensity, pulsed ultrasound for the treatment of nonunion fractures.

Electrical Stimulators- A device used either invasively or non-invasively that applies electrical or electromagnetic currents for the treatment of nonunion fractures.

Orthobiologics - Osteoconductive matrix materials, osteoinductive bone graft substitutes, and osteoprogenitor cells that are used in treating nonunion fractures. Examples include resorbable calcium salt bone void fillers, demineralized bone matrix (DBM), and bone morphogenic proteins (BMP's).

Current list of Orthobiologics and FDA approval status:
(as referenced in the Technical Assessment to be presented at the 10/6/05 MCAC meeting)

Specific Device Name	Company Name	US Food and Drug Administration Status
OP-1 Implant – recombinant osteogenic protein 1 (or BMP-7) and bovine bone collagen In Europe this product is called Osigraft	Stryker Biotech	In October 2001, the FDA granted Stryker Biotech a humanitarian device exemption (HDE) for the use of OP-1 Implant for use as an alternative to autograft in recalcitrant long bone nonunions where use of autograft is unfeasible and alternative treatments have failed.
Infuse Bone Graft – contains recombinant human Bone Morphogenetic Protein-2 in an Absorbable Collagen Sponge (rhBMP-2/ACS) InductOS in Europe	Wyeth Pharmaceuticals	Has premarket approval (PMA in 2004) for use in the treatment of acute, open tibial shaft fractures in adults. To be used with internal fixation (intermedullary nail)

Palacos E-Flow (Osteopal) Bone Cement	Biomet Merck	Has premarket approval (PMA in 1998) for changes in the bone cement composition. The device, as modified, will be marketed under the trade name Osteopal (E-Flow) and is indicated for use as a bone cement in arthroplastic procedures of the hip, knee, and other joins to fix plastic and metal prosthetic parts to living bone when reconstruction is necessary because of osteoarthritis, nonunion of fractures of the neck of the femur, sickle cell anemia, osteoporosis, secondary severe joint destruction following trauma or other conditions (also for fixation of unstable fractures in metastatic malignancies), and revision of previous arthroplasty procedures. Also has 510k clearance as a polymethylmethacrylate bone cement.	
AastromReplicell System – proprietary culture process for the ex vivo production of bone marrow cells, combined with a beta tri-calcium phosphate (Calcibon Granules, Biomet Merck)	Aastrom Biosciences, Inc (Ann Arbor, Michigan)	No approvals. Currently in phase I/II clinical trials in the U.S.	
OsteoSet – calcium sulfate also know as Plaster of Paris OsteoSet –T, osteoset with tobramycin antibiotic	Wright Medical Technology	Received 510k clearance in 1996 as a resorbable calcium salt bone void filler	
OsteoSet BVK kit – contains a sterile pre-measured surgical grade calcium sulfate, mixing solution, tools to mix	Wright Medical Technology	Received 510k clearance in 2001. Resultant paste is to be injected, digitally packed into open bone void/gap that are not intrinsic to the stability of bone structure of the skeletal system (extremities, spine, pelvis). The open bone voids may be surgically created osseous defects or osseous defects created from traumatic injury to the bone.	
OsteoSet DBM pellets – surgical grade calcium sulfate incorporating human demineralized bone matrix (DBM)	Wright Medical Technology	Received 510k clearance in 2004. OsteoSet DBM pellets are indicated only for bony voids or gaps that are not intrinsic to the stability of bony structure. OsteoSet DBM pellets are intended to be gently packed into bony void or gaps of the skeletal system (extremities, spine, pelvis). These defects may be surgically created osseous defects or osseous defects created from traumatic injury to the bone.	Company Web sites mentions its use for nonunions

AlloMatrix Putty – contains demineralized bone matrix (Allogro from AlloSource), carboxymethylcellulose, and OsteoSet	Wright Medical Technology	Received 510k clearance in 2004. AlloMatrix is indicated only for bony voids or gaps that are not intrinsic to the stability of bony structure. AlloMatrix is intended to be gently packed into bony void or gaps of the skeletal system (extremities, spine, pelvis). These defects may be surgically created osseous defects or osseous defects created from traumatic injury to the bone. A variety of other AlloMatrix products were also given 510k clearance in 2004 with the same indications.	Company Web site mentions its use for nonunions
Allogran-R – beta tri-calcium phosphate synthetic bone substitute	Biocomposites (England)	Allogran-R has not been cleared by the FDA for any purpose.	Company Web site mentions its use for nonunions
Norian SRS Bone Void Filler – carbonated hydroxyapatite	Synthes (USA)	Received 510k clearance in 2001. Norian SRS is indicated only for bony voids or gaps that are not intrinsic to the stability of bony structure. Norian SRS is intended to be gently packed into bony void or gaps of the skeletal system (extremities, spine, pelvis). These defects may be surgically created osseous defects or osseous defects created from traumatic injury to the bone.	